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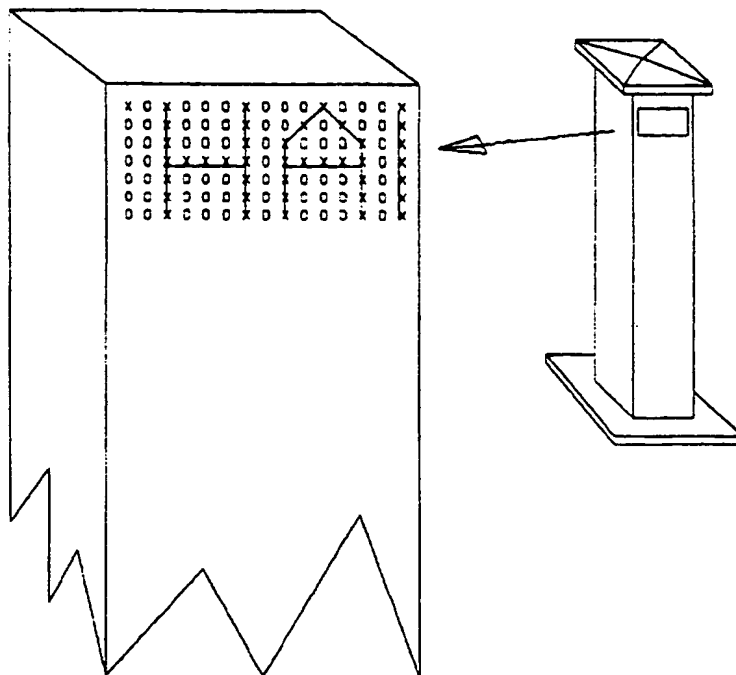
(54) Abstract Title

Scrolling message signpost

(57) An electronic information or sign post consisting of a short length electronic moving message display panel built into a post, or similar arrangement, which may be portable or fixed, and may constitute part of a fence or other barrier, or may be free standing. Optionally, information may be displayed statically, and may be provided by remote means.

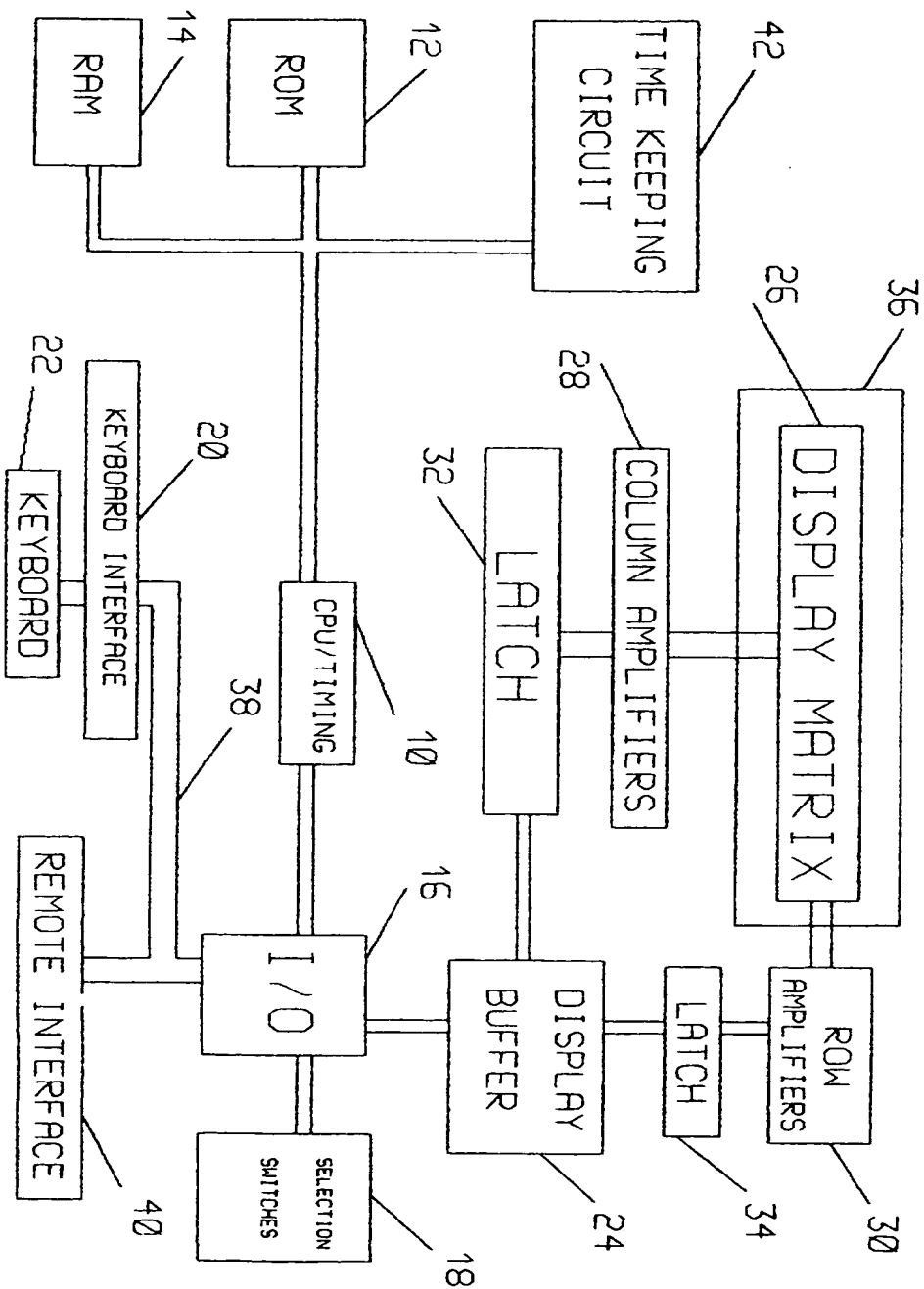
FIG. 3

MESSAGE
SIGN POST



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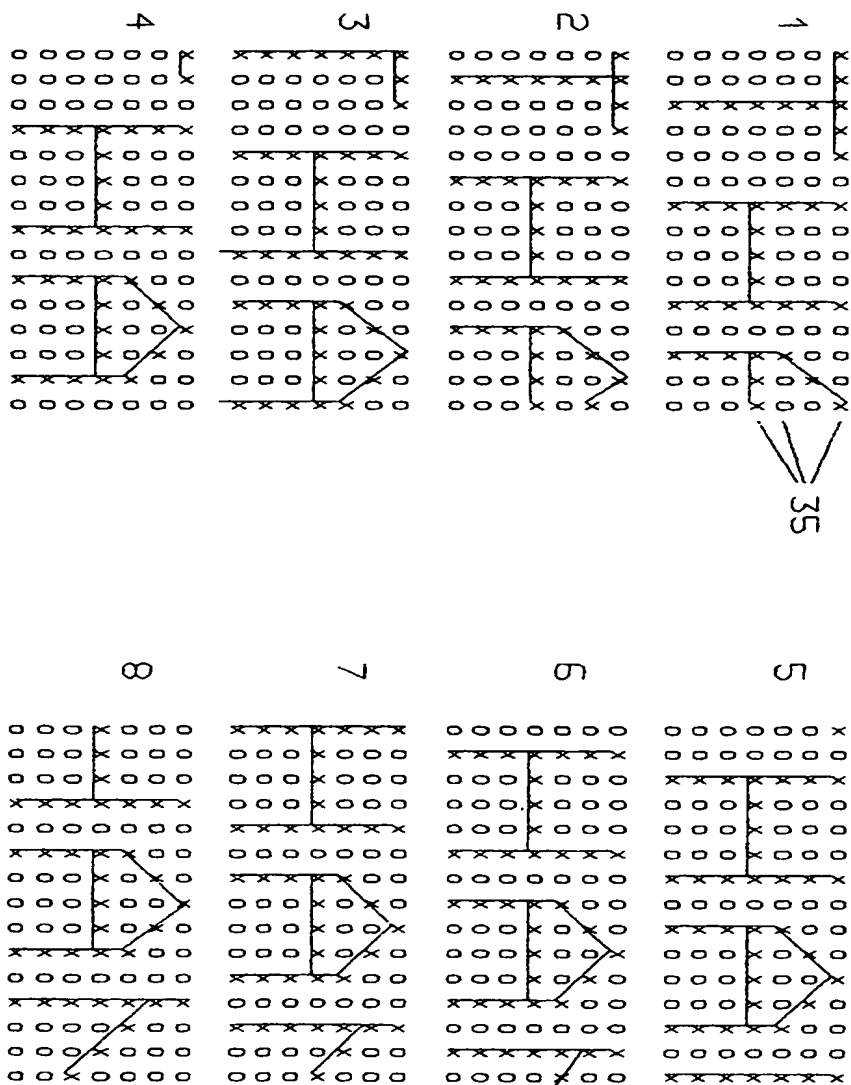
FIG. 1 DISPLAY CIRCUIT



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FIG. 2 DISPLAY MATRIX

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3/6

FIG. 3

MESSAGE
SIGN POST

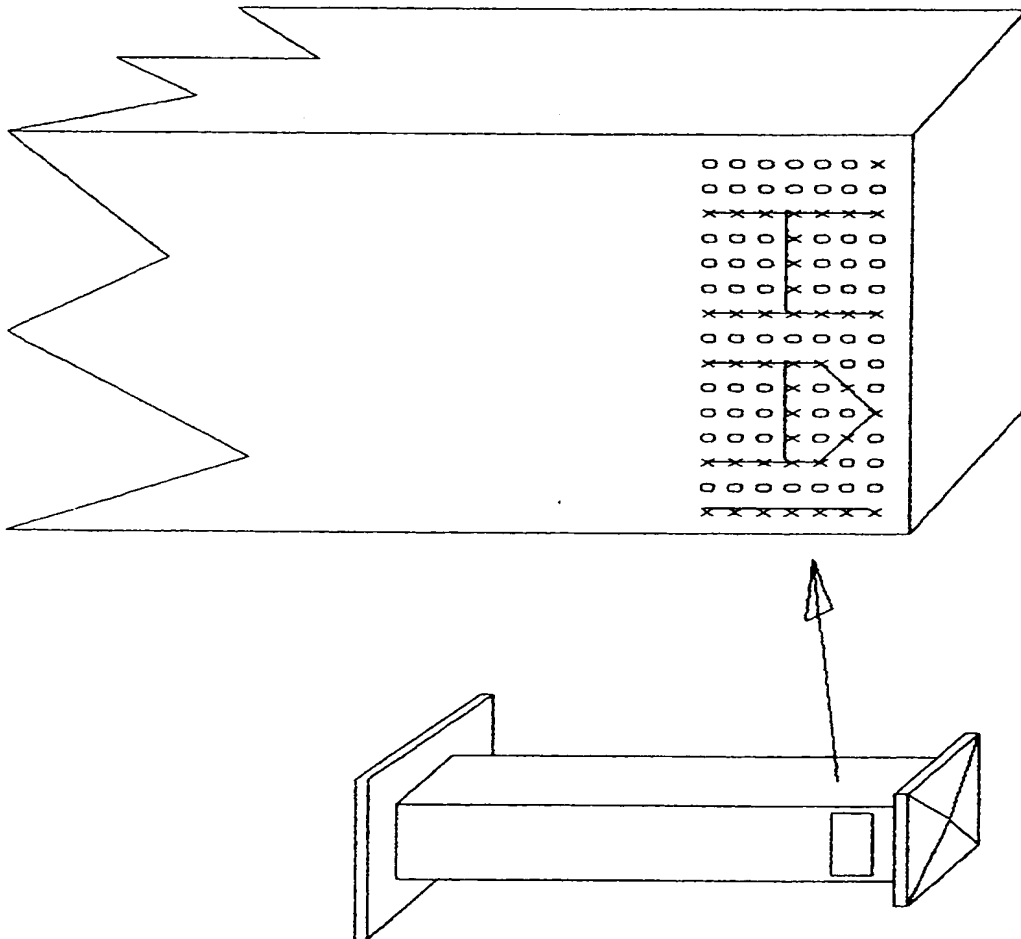


FIG. 4

MESSAGE
SIGN POST

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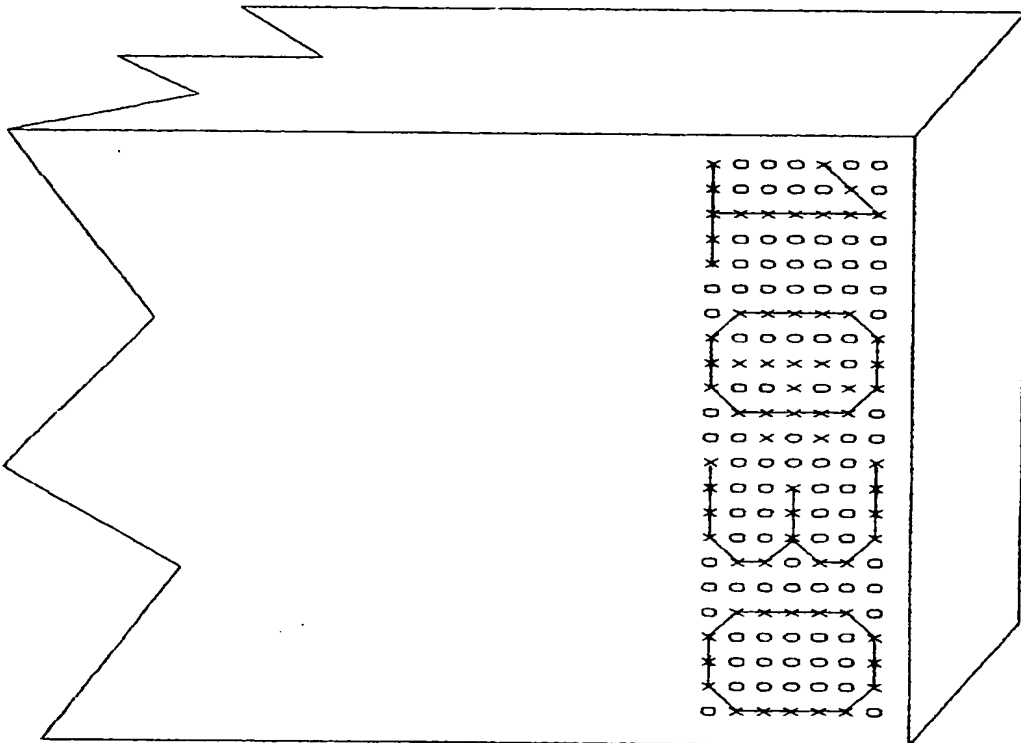
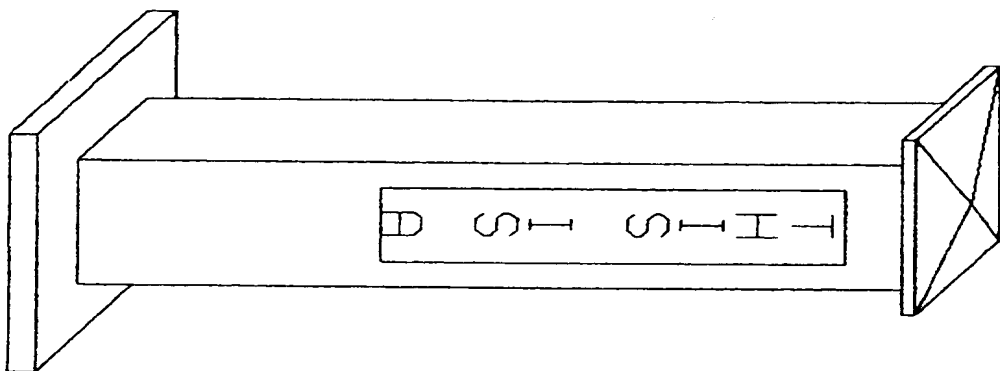


FIG. 5

VERTICAL

MESSAGE

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6/6

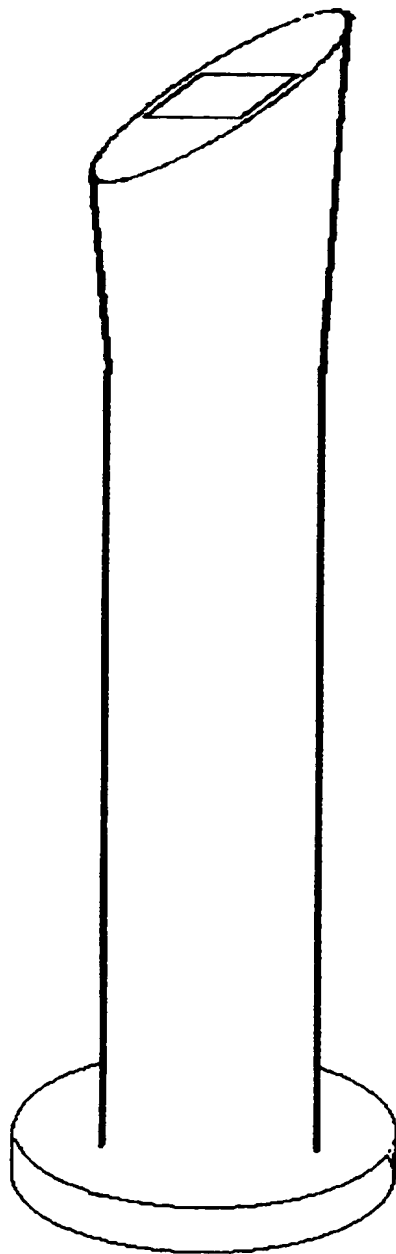


FIGURE 6

SCROLLING MESSAGE SIGN POST

The present invention describes a scrolling message sign post comprising a post, bollard or pole or other suitable housing incorporating a very short length electronic scrolling alpha-numeric message display sign, typically less than 5 characters in length, which permits large character height to be adopted for the message despite the limited physical space available in the horizontal axis thus enabling the message to be viewed at distance with ease.

The sign post may be used in such applications as car parks, gates, entrances, boundaries, exhibition halls, supermarkets and the like, or indeed any application where physical space available in the horizontal axis is limited, to provide information or give instructions, and may be constructed from wood, metal, plastic, composite or other suitable material. Posts or poles are used normally in many situations often to indicate a boundary, sometimes constituting part of a fence, barrier or gate. They are typically 7 to 30 cms. in width - although other formats exist. This invention enables information to be provided as part of the post by incorporating one or more electronic display signs within the design of the post. A conventional

25 100

25
100

scrolling or static electronic message display approach is not appropriate as the restricted width available for incorporating the sign within the post in certain arrangements dictates the use of small height characters, when employing a traditional 12 or 16 character length display. This would result in the display not being able to be read easily at distance.

However useful character height may be increased by a factor of 3 to 6 if a short length scrolling display is used, consisting of approximately 4 or less characters in length, which also fits well with the physical dimensions of the post.

Where it is needed to display very large characters the post design may be scaled to suit requirements.

Alternatively a vertical scrolling message display arrangement may be used to take advantage of the normal orientation of the post or pole. This enables the character length of the display to be increased greatly without reducing character height whilst the message is scrolled in the vertical axis. This advantage is gained at the expense of a less natural viewing arrangement.

The post may also be defined as a pole, housing or other suitable form of packaging arrangement, and may be round, circular, oval, square, rectangular, triangular or any other regular or irregular cross-section and may have one or more display panels fitted to aid viewing from various directions.

Previous Patents have described row-column connected scrolling displays in a mathematical sense as consisting of one character or more. However those descriptions took no account of the fact that a scrolling display one character in width is not of practical use, as the information displayed is indiscernible by a human observer because of the inability of the human brain to make sense from the flashing light element matrix. This is a consequence of the way in which the data is updated. In fact the technique only becomes practical for human observation when the display width is approximately two or more characters wide as a minimum.

Nevertheless, the applicant has found that effective communication can be achieved using a much shorter scrolling display unit than conventionally employed, in which only a small number of characters, e.g. four or less or, preferably, three or less, can be displayed at any one time as a message of many more characters is scrolled across the

display. Surprisingly, it has been found that the human eye/brain system is still capable of discriminating messages of any given length without difficulty when only three characters or less are displayed simultaneously.

In consequence of this lack of realisation, traditional scrolling message displays have been configured conventionally to be typically 12 or 16 characters or more in width thus defining the dimensions and aspect ratio of the overall unit for a given character height.

It will be appreciated that a vertical scrolling arrangement may be described similarly to that above, where the length is to be understood related to the normal scrolling plane of the display.

Accordingly, the invention provides an electronic scrolling display unit mounted in a pole or post comprising an electronic control circuit and a multiple element display panel, wherein the control circuit comprises a timing unit, storage means, input means and output means, the output means being coupled to the display panel, wherein the control circuit is capable of providing sequential data to the display panel representing a message, or optionally when selected, provides a static alpha-numeric display.

It may be advantageous for the length of the display panel to be less than 5 characters in length, or for the message to be of a length greater than the length of the display panel.

In some cases it is preferable for the ratio of message length to the display panel length to be greater than or equal to 2:1.

One advantage of a short length horizontal display is that it produces overall geometries for a display sign of approximately 2:1 to 4:1 in terms of the display panel length to height ratio. This facilitates greatly improved packaging arrangements when compared with conventional length scrolling display signs. As a consequence, substantially greater character heights may be adopted for a given display length than would be the case when conventional character length displays are used having overall geometry in the region of 10:1. The larger height of the characters results in the message display being more easily read at greater distance.

Furthermore, the resultant display can be made less expensively than conventional displays because of the

reduced number of light emitting elements and associated parts and packaging needed.

Such a design requires between 10% and 20% of the number of light emitting elements needed in conventional displays. The matrix elements may comprise LCD, LED, gas discharge, incandescent or other optical techniques, or video panels may be used. Low persistence devices are of advantage in ensuring display quality.

According to another aspect, the invention provides a post design including a horizontal electronic scrolling display panel wherein the width of the display panel is such as to display only a minimum number of characters in whole or in part simultaneously whereby the entire message is still clearly understandable to an onlooker.

According to a further aspect, the invention provides means for selecting pre-stored messages or for displaying further messages through a keyboard or remote interface, which may include speech recognition techniques with or without a switch input as confirmation of the voice signal. The switch input may select operation of speech recognition for use in forming/selecting messages for display.

According to another aspect, the invention provides

optionally for a voice signal, or other audio, output equivalent to the displayed message.

The invention will now be described by way of example with reference to the drawings in which:-

Figure 1 is a block diagram of a message display unit in accordance with the present invention.

Figure 2 is a diagram illustrating a 7 x 15 display matrix with different successive energised states.

Figure 3 is a diagram of one embodiment of the sign post incorporating the scrolling display showing one of the energised states from figure 2.

Figure 4 shows another embodiment with a static time display.

Figure 5 shows an embodiment of a vertical display.

Figure 6 is another embodiment of the sign post where the display panel is shown on the upper surface.

With reference to Figure 1, an electronic circuit for controlling the display comprises a microcomputer circuit consisting of a central processing or timing unit 10, a program memory 12, a data memory 14 and input/output circuitry 16. In applications where only pre-recorded messages need be displayed, the control circuit may be a

simpler electronic sequencer design providing fabrication cost benefits. The program and data memories 12, 14 contain a plurality of messages, either predefined or entered via the keyboard or remote interfaces, which can be selected either, by switch means 18 connected to the input line, by a keyboard interface 20 using a keyboard 22, or by the remote interface using parallel or serial communication techniques incorporating wired, radio, optical, microwave, audio or other transmission mediums.

Alternatively, data may be transferred to the data memory 14 to cause information to be displayed statically.

Once a message has been selected the central processing unit 10 transfers the relevant data representing to each character from its memory 14 to a display buffer memory 24 such that data stored in the buffer memory 24 represents an image of the instantaneous sequential bit pattern for each character, up to the maximum number of characters capable of being displayed at one time in a display matrix 26. In the example of a 2.6 character wide display, the first 15 bits of column data are selected from the buffer memory 24 for each row in turn, and are applied to the display matrix 26 via a column amplifier 28 and a row amplifier 30, and their corresponding latches 32, 34, whilst the appropriate row is

energised and held for a predetermined time. Following each complete cycle the data within the display buffer memory 24 is shifted along one position and the whole display cycle is repeated again during which the appropriate data bits for further characters are organised within the central processing unit 10 and transferred into the display buffer memory 24. The process can be used to produce a message display capable of scrolling in any direction or alternatively remaining static. According to how the buffer memory 24, amplifiers 28, 30 and latches 32, 34 are arranged, and according to the program stored in the program memory 12, the apparatus of Figure 1 can be configured to cause a message to be moved from one end to the other of the display panel or up and down by illuminating the matrix elements in an appropriate sequence.

A similar description relates to a vertical scrolling display design.

As before, it will be understood that references to the "length" of the display panel and the "length" of the message to be displayed in this specification are to be construed as being the "length" of each in the direction of movement of the message with respect to the panel.

A shift register can be used in place of the latches 32, 34

although latches are preferable due to the low number of columns driven by the latch to output column data, whereby the interval between subsequent column data bits is greatly reduced resulting in improved appearance of the displayed message.

Referring to Figure 2, the display elements 35 are arranged in a 7 x 15 matrix. The elements are driven such that characters generally each occupy 5 columns of elements with a 1-column spacing, resulting in a display only 2.6 characters wide. A matrix of this size can be seen in Figure 2 in which the first part of the word "THANKYOU" (occupying 8 character widths) is displayed on the matrix display of 2.6 characters width in a scrolling manner, scrolling from right to left. The first 8 sequential illuminated matrix positions of the word are shown.

Figure 4 shows a static display of time using a 4 character wide version of the display. Other indication may be given statically within the limitation of the particular display length chosen for a given design; e.g. "EXIT" or "FIRE" warnings may be given on a 4 character wide embodiment. Other alternatives exist for smaller length displays.

Figure 5 illustrates the increased number of characters

which may be displayed simultaneously adopting a vertical arrangement.

As an alternative to the arrangement described above, but at the expense of electronic complexity, the illuminated matrix elements may be powered individually instead of adopting a row and column approach - this approach is less of a problem practically when the display length is limited to a small number of characters, as described, such that the number of connections is not excessive. Even so, as an example, a 7 x 15 matrix would require 105 driving circuits, compared with 22 for the conventional design. However, this arrangement may be adopted to provide an improved quality display for short length panels.

It will be appreciated that the size of the display panel can be expressed in characters or characters and part-characters or in other ways, and that the characters themselves may be represented by various matrix element structures besides the ones indicated.

Where reference has been made to alphanumeric display characters throughout this description it is taken to include other graphics characters or shapes which are capable of being defined by the display matrix.

CLAIMS

1. A sign, or information, post incorporating a short length scrolling message display device comprising an electronic control circuit and a multiple element display panel included within the design of, or attached to, the post, bollard, pole or similar housing or support, wherein the control circuit comprises a timing unit, storage means, input means and output means, the output means being coupled to the display panel, wherein the control circuit is capable of providing sequential data to the display panel representing a message or other information which appears to move along the display as a consequence of illuminating elements of the display in a predetermined sequence, and, wherein the display panel is less than 5 characters approximately in length, the message length is greater than the length of the display panel and the post or housing overall dimensions have an aspect ratio where the height is not less than the width, approximately.
2. A unit according to claim 1 whereby data may be displayed statically.

3. A unit according to any other claim whereby information is displayed in the horizontal plane.
4. A unit according to any other claim whereby information is displayed in the vertical plane.
5. A unit according to claim 1 wherein the post or housing has an approximate overall height to width aspect ratio of not less than 2 : 1.
6. A unit according to claim 1 wherein the post or housing has an approximate overall height to width aspect ratio of not less than 4 : 1.
7. A unit according to claim 1 wherein the post or housing has an approximate overall height to width aspect ratio of not less than 8 : 1.
8. A unit according to claim 1, wherein the ratio of the message length to display panel length is greater than or equal to 2:1.
9. A unit according to other claims, wherein the display panel is less than 4 characters in length.
10. A unit according to other claims, wherein the display

panel is less than 3 characters in length.

11. A unit according to other claims, wherein the display panel is approximately 2 characters in length.
12. A unit according to other claims, wherein the control circuit is capable of providing data to the display representing time.
13. A unit according to other claims, wherein the control circuit is capable of providing data to the display representing temperature.
14. A unit according to other claims, wherein the control circuit is capable of providing data to the display representing weight or other value.
15. A unit according to other claims, wherein the control circuit is capable of providing data to the display representing the word "EXIT" or similar.
16. A unit according to other claims, wherein the control circuit is capable of providing data to the display representing the word "FIRE" or similar.

17. A unit according to claims 12 to 16, whereby this data is displayed statically.
18. A unit according to any other claim, wherein means is provided for incorporating function as an electronic counter.
19. A unit according to any other claim, wherein means is provided for incorporating a time keeping function.
20. A unit according to any other claim, wherein means is provided for incorporating function as a temperature gauge.
21. A unit according to any other claim, wherein means is provided for incorporating function as a weighing machine or other measuring instrument.
22. A unit according to any other claim, wherein means is provided for incorporating function as an "exit" or other sign.
23. A unit according to any other claim, wherein means is provided for incorporating function as a "fire" or other alarm.

24. A unit according to any preceding claim, wherein the display panel is a matrix display.
25. A unit according to claim 24, wherein the matrix display incorporates LED, LCD, gas discharge, incandescent or other optical display elements, or where the matrix panel is simulated by a video panel.
26. A unit according to any other claim, wherein the length to height ratio of the display panel is less than 4:1.
27. A unit according to any other claim, wherein the length to height ratio of the display panel is less than 3:1.
28. A unit according to any other claim, wherein the length to height ratio of the display panel is approximately 2:1.
29. A unit according to claim 1, wherein the electronic control circuit is arranged to display information in the form of characters which appear to move from one end to the other or up and down depending on geometry of the display panel as a consequence of illuminating

elements of the matrix in a predetermined sequence.

30. A unit according to any other claim whereby the length of the display panel is defined with regard to the display plane.
31. A unit according to any other claim, wherein the electronic control circuit is arranged such that the illumination of the display can be varied in whole or in part.
32. A unit according to any other claim, wherein the input means include a plurality of display selection switches.
33. A unit according to claim 32, arranged such that operation of the switches causes different selected messages to be displayed.
34. A unit according to any other claim, wherein the input means include a speech recognition system for supplying, selecting or defining messages.
35. A unit according to claim 34, further comprising means for selecting speech recognition as the input means.

36. A unit according to any other claim, wherein the input means includes a keyboard interface, the electronic control circuit being arranged such that user-defined information entered using a keyboard coupled to the keyboard interface can be displayed.
37. A unit according to any other claim, wherein the input means includes a switch interface for connection to display selection switches.
38. A unit according to any other claim, wherein the input means include a wired interface for connecting the unit to a computer or other electronic system for defining or selecting information.
39. A unit according to any other claim, wherein the input means include a radio paging or other electromagnetic wave interface for defining or selecting information.
40. A unit according to any other claim, wherein the input means include an infra-red or other optical interface for defining or selecting information.
41. A unit according to any other claim, wherein the input means include a speech, ultrasonic, or other acoustic

wave interface for defining or selecting information.

42. A unit according to other claims, wherein the input means provides for different information to be selected or defined.
43. A unit according to any other claim, wherein the electronic control circuit comprises a computer circuit including a central processing unit, memory means for storing a control program and messages for display, and input/output means for feeding display control signals to the display panel.
44. A unit according to any other claim, wherein the elements of the display panel are electrically driven employing a row and column arrangement.
45. A unit according to any other claim, wherein the elements of the display panel are electrically driven individually.
46. A unit according to any other claim, wherein the output means include speech or other audible output.
47. A unit according to any other claim where the post

includes one or more display panels.

48. A unit according to any other claim whereby the display panel or panels are constructed to display one or more lines of information.
49. A unit according to any other claim whereby the post is part of a fence, gate, barrier, or other boundary delimiter.
50. A unit according to any other claim whereby the post is portable or free standing.
51. A unit according to any other claim whereby the post is fixed in position.
52. A unit according to any other claim whereby the post is mounted on a plinth, plate, stand or other base.
53. A unit according to any other claim whereby the post design incorporates a cap.
54. A unit according to any other claim whereby the post is constructed from metal, wood, plastic, composite or other suitable material.

55. A unit according to any other claim whereby the post is constructed to be, approximately, 0.5 to 2.0 metres high and 60 to 250 cms wide.
56. A unit according to any other claim whereby the physical outline of the display panel is arranged to be included within the overall outline dimensions of the post.
57. A unit according to any other claim whereby the display panel physical outline falls outside the overall dimensions of the supporting post.
58. A unit according to any other claim whereby the overall dimensions of the post are arranged to be suitable in applications where physical space available in the horizontal axis is required to be limited whilst still enabling displayed information to be viewed at distance with ease.
59. A unit according to any other claim whereby the post is of round, circular, oval, square, rectangular, triangular or any other regular or irregular cross-section.

- 60. A unit according to any other claim whereby the post is a pole or other similar supporting structure.
- 61. A unit according to any other claim whereby the description of a post is taken to define any housing or other form of packaging arrangement.
- 62. A unit according to any previous claim, wherein the electronic control circuit is arranged such that the speed of the scrolling message displayed can be varied.
- 63. An item constructed and arranged substantially as herein described.



Application No: GB 9819457.4
Claims searched: 1 to 63

Examiner: Geoffrey Pitchman
Date of search: 21 December 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): G5C (CHA CHF CDBX)

Int Cl (Ed.6): G09G 3/00

Other: ONLINE: EDOC WPI JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2246058 (RICOH)	
A	GB 2098365 A (CITIZEN WATCH)	
A	US 4298865 (SHARP)	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.